

# Macroprudential Regulation of Credit Booms and Busts

The Experience of the National Bank  
of the Republic of Macedonia

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## Abstract

This paper provides an overview of the macroprudential measures undertaken by the National Bank of the Republic of Macedonia to prevent further deterioration of the systemic risk and to promote resilience of the banking system. The measures were generally aimed at addressing the time dimension of the systemic risk and

were intended to protect the banking system against the increase of credit risk arising from the credit boom. The paper also outlines the future challenges facing financial regulation and supervision, as well as the most important quantitative and qualitative impacts of the utilized macroprudential measures.

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**Macprudential Regulation of Credit Booms and Busts:  
The Experience of the National Bank of the Republic of Macedonia**

by

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# **Macprudential Regulation of Credit Booms and Busts: The Experience of the National Bank of the Republic of Macedonia<sup>1</sup>**

## **Introduction**

From 2004 to 2008, the economy registered the highest average real growth of gross domestic product (GDP) in the country's overall transition period, at around 5 percent per annum. There has been both strong external demand for goods and services produced in the country and an increase in domestic demand. In 2007 and 2008, a broad set of indicators confirms that the economy was running above its potential. One of the main driving forces of the domestic demand was the credit growth that was strongly accelerating in these years. The credit growth in the banking system had intensified since 2004, somewhat later than in other, more advanced transition economies. The share of total credits to the private sector to GDP in 2000–2003 was relatively stable at around 15 percent, but grew continuously after that from around 20 percent in 2004 to around 40 percent in 2008. This strong credit growth has been supported by combination of the following factors:

1. The macroeconomic environment stabilized after some external and internal noneconomic shocks in 1999 and 2001. This enabled risk reduction and positive expectations and therefore lower credit risk of the banks' clients.
2. In line with positive expectations, there was an increase in the banks' deposits, which became a main financing source of the banks' business, thus enabling stronger credit growth.
3. The banking sector's competitiveness was strengthened, especially after the entrance of foreign capital into the largest banks in the previous years, which led to a gradual decline of the lending interest rates and diversification of the supply of credits by types, maturities, and conditions.
4. Finally, the intensified financial intermediation by the banking system was additionally supported by the legislative amendments of the FX legislation in 2003, which had extended the ability to lend in foreign currency to all entities, including households, and not only to enterprises for payments abroad.

The credit expansion in some ways coincided with the initial stage of the latest world economic and financial crisis. Therefore, the National Bank of the Republic of Macedonia (NBRM) faced a twofold challenge: on one side it had to protect the banking system from the adverse impacts of the excessive credit growth, and on the other side it had to avoid negative spillovers from the world financial crisis. This paper discusses the measures that the NBRM undertook during the period of fast credit growth. The first section of this paper outlines the analysis of the financial system and its structural features, followed by the analysis of the

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<sup>1</sup> This paper was prepared as background to a forthcoming World Bank report titled "Golden Growth: Restoring the Lustre of the European Economic Model." The paper's findings, interpretations, and conclusions are entirely those of the authors and do not necessarily represent the views of the National Bank of the Republic of Macedonia, or NBRM, which is the central bank of the FYR Macedonia. It also does not represent the views of the World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent. All errors and omissions remain entirely the responsibility of the authors. The authors may be contacted at CeleskaF@nbrm.mk, GligorovaV@nbrm.mk, and KrstevskaA@nbrm.mk.

macroeconomic environment and the monetary policy measures. The second section focuses on the macroprudential measures undertaken by the NBRM and the future challenges the NBRM faces. The last section summarizes the main conclusions and experiences from the utilization of the macroprudential measures and their impact on the banking system.

## **I. How Important Is the Financial Sector?**

A stable and sound financial system is an indispensable prerequisite for a country's macroeconomic stability. Supporting the development of a sound and efficient financial system is part of the basic tasks of the NBRM. The banking sector dominates the financial sector in the country, which is under the direct regulatory and supervisory authority of NBRM. Yet the responsibility for the safety and soundness of the overall financial system is shared with the other regulatory and supervisory bodies in the country.

### Main structural features of the financial sector

One of the main structural features of the financial system is its relatively simple structure, as evidenced by the type of financial institutions and the range of products and services offered (Table 1). Pension system reform, developments within the capital market, and the entrance of foreign strategic investors in different segments of the financial system have increased the system's diversification. These factors have also promoted competition among both the same types as well as different types of financial institutions. The structural changes within the financial system were accompanied by a significant increase in its size, leading to a continuous increase of financial intermediation.

Nondepository financial institutions have a relatively small role in the financial intermediation, and their potential influence on financial stability is quite limited. Nonetheless, a gradual increase of their significance should be expected, which will impose the need for cautious monitoring of developments within this subsector. Except for brokerage houses and investment fund management companies, nondepository financial institutions are predominantly foreign owned.

A low level of intersectoral integration and limited cross-sectoral ownership among the separate financial segments are two of the main features of the financial sector. They potentially limit the range of products and services offered. However, on the upside this feature minimizes possible negative effects of contagion risk. As noted, the banks are the "major players" within the financial architecture, and they influence the movements in the financial system to the largest extent.

In the past several years the banking system has undergone a process of substantial consolidation as well as a period of significant growth. Several mergers, acquisitions, liquidations, and bankruptcy procedures reduced the number of depository institutions from 21 banks and 15 savings houses at the end of 2004 to 17 banks and 8 savings houses at the beginning of 2011.<sup>2</sup>

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<sup>2</sup> Due to an acquisition that took place in January 2011, the number of banks operating in the country dropped from the oft-reported 18 (at the end of 2010) to 17.

**Table 1. Structure of the financial system<sup>3</sup>**

Type of financial institutions	Total assets (in millions of Denars)			Structure			Number of institutions			Total assets / GDP		
	2005	2009	2010	2005	2009	2010	2005	2009	2010	2005	2009	2010
<b>Depository financial institutions</b>	<b>142,391</b>	<b>271,825</b>	<b>308,265</b>	<b>89.7%</b>	<b>89.7%</b>	<b>n.a.</b>	<b>34</b>	<b>28</b>	<b>26</b>	<b>48.3%</b>	<b>66.4%</b>	<b>72.7%</b>
Banks	140,436	268,543	305,290	88.4%	88.6%	n.a.	20	18	18	47.6%	65.6%	72.0%
Saving houses	1,955	3,283	2,975	1.2%	1.1%	n.a.	14	10	8	0.7%	0.8%	0.7%
<b>Nondepository financial institutions</b>	<b>16,427</b>	<b>31,347</b>	<b>n.a.</b>	<b>10.3%</b>	<b>10.3%</b>	<b>n.a.</b>	<b>23</b>	<b>76</b>	<b>n.a.</b>	<b>5.6%</b>	<b>7.7%</b>	<b>n.a.</b>
Insurance companies	13,618	12,202	n.a.	8.6%	4.0%	n.a.	10	13	n.a.	4.6%	3.0%	n.a.
Insurance brokers	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.	n.f.	12	n.a.	n.f.	n.a.	n.a.
Insurance agents	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.	n.f.	5	n.a.	n.f.	n.a.	n.a.
Leasing companies	2,276	9,115	n.a.	1.4%	3.0%	n.a.	2	9	n.a.	0.8%	2.2%	n.a.
Pension funds	n.f.	8,752	12,494	n.f.	2.9%	n.a.	n.f.	4	4	n.f.	2.1%	2.9%
Pension fund management companies	174	333	n.a.	0.1%	0.1%	n.a.	2	2	2	0.1%	0.1%	n.a.
Brokerage houses	359	754	n.a.	0.2%	0.2%	n.a.	9	18	n.a.	0.1%	0.2%	n.a.
Investment funds	n.f.	152	n.a.	n.f.	0.1%	n.a.	n.f.	8	n.a.	n.f.	0.0%	n.a.
Investment fund management companies	n.f.	40	n.a.	n.f.	0.01%	n.a.	n.f.	5	n.a.	n.f.	0.01%	n.a.
Private equity funds	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.
Private equity fund management companies	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.	n.f.	n.a.	n.a.
<b>Total</b>	<b>158,818</b>	<b>303,172</b>	<b>n.a.</b>	<b>100.0%</b>	<b>100.0%</b>	<b>n.a.</b>	<b>57</b>	<b>104</b>	<b>n.a.</b>	<b>53.8%</b>	<b>74.1%</b>	<b>n.a.</b>

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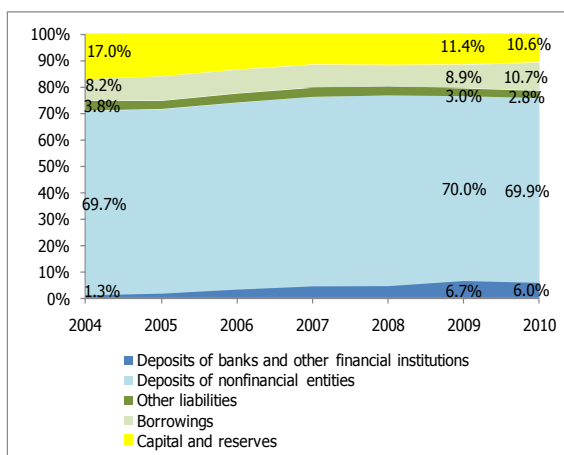
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<sup>3</sup> Source of data for all tables and charts: National Bank of the Republic of Macedonia ([www.nbrm.mk](http://www.nbrm.mk)).

These structural changes were accompanied by an extensive transformation of the ownership of banks. The driving force of this transformation was the entrance of several new strategic investors: foreign financial institutions. At the end of 2010, the number of foreign-owned banks was 15,<sup>4</sup> of which 9 were subsidiaries of foreign banks.<sup>5</sup> For comparison, at the end of 2004 the number of foreign-owned banks was eight, only four of which were subsidiaries of foreign banks. At the end of 2010, foreign capital accounted for 72.9 percent of the overall capital of the banking system (an increase of 25.4 percentage points from the end of 2004<sup>6</sup>). Thus, at the end of 2010, foreign-owned banks hold 92.9 percent of total assets, 95.4 percent of total loans, and 95.8 percent of total deposits of the banking system. This market consolidation and ownership transformation is interesting in and of itself, but it should be viewed in a wider context, having in mind the benefits of the organizational and managerial changes that, in the long run, should increase the level of the stability and competitiveness of the overall banking system.

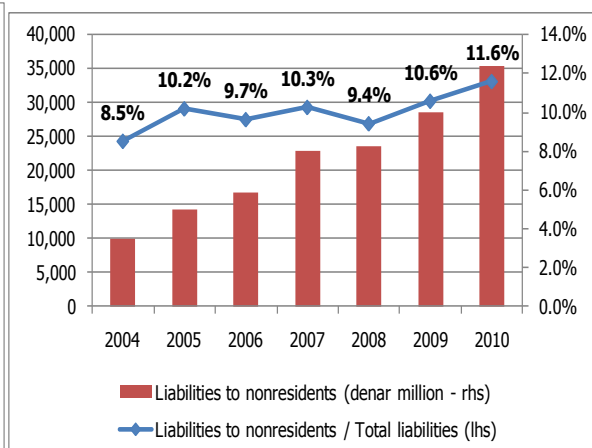
In general, the shift to foreign ownership did not bring about major structural changes in the sources of financing of the banking system. Most of the banks still tend to foster their growth primarily on domestic sources of financing: on deposits from residents (Chart 1 and Chart 2). The orientation of banks toward domestic financing proved to be essential in maintaining the stability of the domestic banking system in conditions of global financial disruptions.

**Chart 1. Structure of banks' liabilities**



Source: NBRM

**Chart 2. The role of nonresidents in financing banks' activities**



<sup>4</sup> Foreign-owned banks are considered those where foreign shareholders own more than 50 percent of the total number of issued common shares.

<sup>5</sup> Subsidiaries of foreign banks are considered banks predominantly owned by foreign banks (more than 50 percent of the total number of issued common shares in a bank is owned by a foreign bank).

<sup>6</sup> The biggest growth of the foreign capital share in the overall capital of the banking system was registered in 2007 (13.0 percentage points), followed by 2008 with 5.2 percentage points and 2005 with 5.0 percentage points. A decrease by 5.7 percentage points in the foreign capital share was observed in 2009.

## The role of the banking system

In the past several years, the banking system underwent significant transformation with regards to its market and ownership structure, the volume and array of its activities, and its performance. These changes enriched the spectrum of products and services offered, expanded the banking network, and stimulated the development of business practices and managerial skills in the banking system. Thus, the banking system gradually but steadily has been strengthening its role as an economic life bloodstream, visibly developing its role and significance in the overall economy.

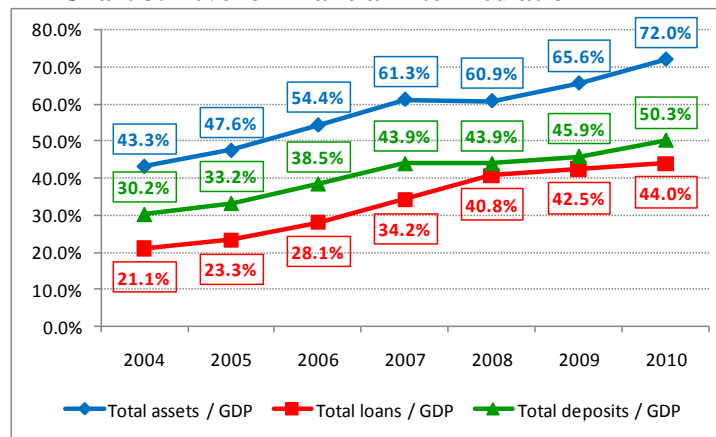
**Table 2. Growth of banks' assets versus GDP growth**

Indicator	2004	2005	2006	2007	2008	2009	2010
Nominal annual growth rate of assets	12.5%	19.0%	24.0%	28.5%	12.1%	7.1%	13.7%
Nominal annual growth rate of GDP	5.5%	8.3%	8.5%	14.0%	12.8%	-0.6%	3.6%
Annual rate of inflation*	-0.4%	0.5%	3.2%	2.3%	8.3%	-0.8%	1.6%
Real annual growth rate of assets**	13.0%	18.4%	20.1%	25.6%	3.5%	8.0%	11.9%
Real annual growth rate of GDP	4.6%	4.4%	5.0%	6.1%	5.0%	-0.9%	0.7%
Absolute value of the ratio between nominal annual growth rate of total assets and GDP	2.29	2.30	2.83	2.03	0.94	11.15	3.79
Absolute value of the ratio between real annual growth rate of total assets and GDP	2.82	4.19	4.03	4.19	0.70	8.87	17.04

\* Average, on cumulative basis (Consumer Price Index – CPI)

\*\* Calculated using the annual rate of inflation

**Chart 3. Level of financial intermediation**



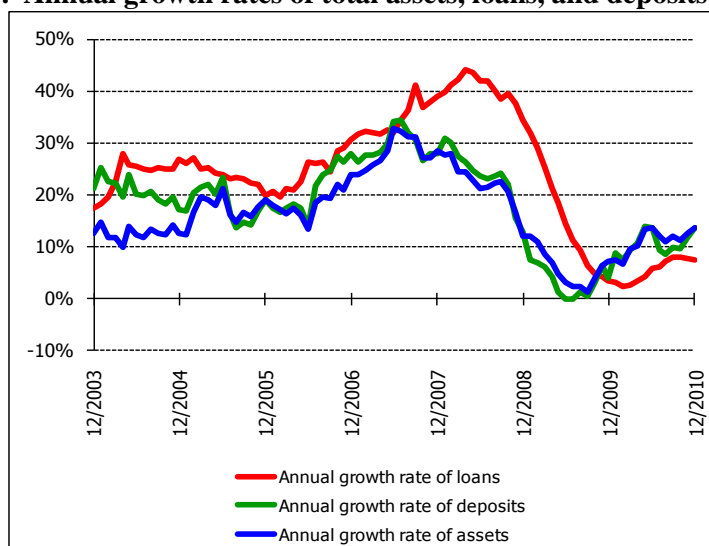
Source: NBRM

The growth of the level of financial intermediation confirms the increased role of the banking system in the overall economy (Table 2 and Chart 3). The ratio of total banking system assets to GDP was 43.3 percent at the end of 2004 and rose to 72 percent at the end of 2010. The increased level of financial intermediation is also evident through the continuous growth of the ratios of total loans and total deposits to GDP. The ratio of total loans to GDP grew at a faster pace than did growth in deposits. Still, the ratio of total deposits to GDP is somewhat higher. At the end of 2010 it reached 50.3 percent as opposed to the ratio of total loans to GDP of 44 percent. Despite the dynamic growth over the past several years (with exception of 2008 and 2009, when the global financial crisis influenced the domestic economy the most), the banking system still belongs



among banking systems with a relatively low degree of financial intermediation.<sup>7</sup> This is due to the sluggish growth in the first decade of the transition period, which, on a more positive note, created the potential for the subsequent acceleration of the growth of the banking system (Chart 4).

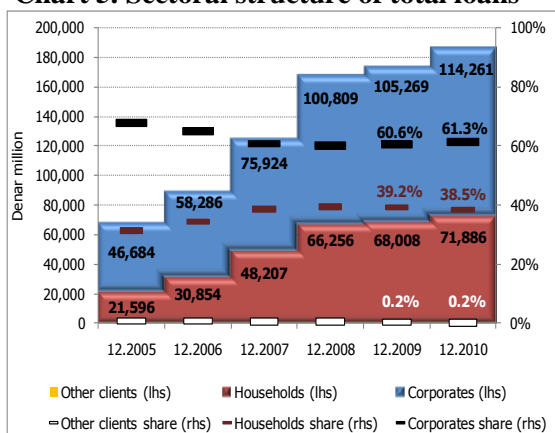
**Chart 4. Annual growth rates of total assets, loans, and deposits of banks**



Source: NBRM

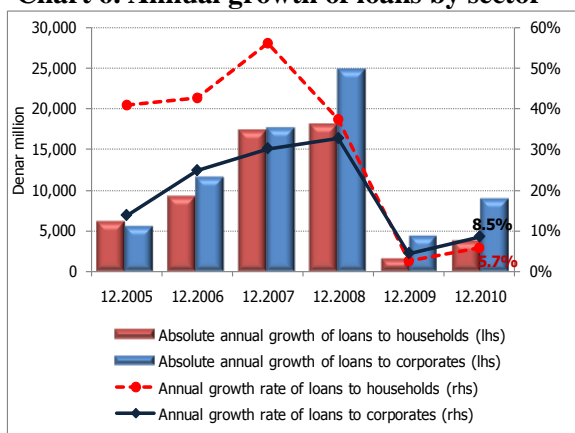
In spite of the faster growth of credit support to households (particularly until 2008), loans to the corporate sector still constitute the largest share of total loans to the nonfinancial sector (Chart 5 and Chart 6). At all times during the past several years, loans to corporations formed above 60 percent of total loans, while the highest share of loans to households was 39.5 percent, in 2008. The share of loans to other clients (nonresidents, the state, and so forth) is an insignificant part of the overall credit portfolio to nonfinancial entities (below 1 percent).

**Chart 5. Sectoral structure of total loans**



Source: NBRM

**Chart 6. Annual growth of loans by sector**



<sup>7</sup> More detailed comparisons of the banking system of this country with the banking systems of other countries can be found in the Annual Reports on the banking system and the bank supervision on NBRM Web site: [www.nbrm.mk](http://www.nbrm.mk).

Table 3. Total credit exposure by activities and by credit products

Sectors	Type of product / activity	Credit exposure as of December 31, 2010 (denar million)	Annual growth (denar million)	Annual growth rate	Share in annual growth of total credit exposure
<b>NATURAL PERSONS</b>	Housing loans	17,066	2,180	14.6%	40.0%
	Consumer loans	28,461	3,333	13.3%	61.1%
	Overdrafts	9,252	798	9.4%	14.6%
	Credit cards	23,147	-302	-1.3%	-5.5%
	Auto loans	4,219	-486	-10.3%	-8.9%
	Other loans	1,124	-69	-5.8%	-1.3%
<b>TOTAL NATURAL PERSONS</b>		<b>83,269</b>	<b>5,454</b>	<b>7.0%</b>	<b>13.7%</b>
<b>CORPORATES</b>	Agriculture, forestry and fishing	4,329	74	1.8%	0.7%
	Industry	49,948	1,493	3.1%	13.5%
	Construction	15,423	1,297	9.2%	11.7%
	Wholesale and retail	44,752	3,737	9.1%	33.8%
	Transport, storage, information and communication	10,860	2,922	36.8%	26.4%
	Accommodation and catering	3,698	-97	-2.6%	-0.9%
	Real estate, professional, science and technical activities and administrative service activities	8,216	1,124	15.9%	10.2%
	Other activities	4,049	496	14.0%	4.5%
<b>TOTAL CORPORATES</b>		<b>141,274</b>	<b>11,047</b>	<b>8.5%</b>	<b>27.8%</b>
<b>TOTAL CREDIT EXPOSURE</b>		<b>316,123</b>	<b>39,714</b>	<b>14.4%</b>	<b>100.0%</b>

Note: Total credit exposure includes exposures to natural persons, corporates and other clients. The amount of credit exposures to other clients is not separately shown in the table

Within the corporate sector, the highest share of total credit exposure is to industrial firms (Table 3). At the end of 2010, this credit exposure was 35.4 percent of the total credit exposure to the corporate sector and 15.8 percent of the total credit exposure to all sectors (financial and nonfinancial). Credit support to wholesale and retail firms, at 31.7 percent, holds the second largest share in the total credit exposure to the corporate sector. Most of the credit support to households is channeled through consumer loans, which alone constituted 34.2 percent of the overall credit exposure to this sector at the end of 2010. The other types of loans that are generally used for consumer purposes (overdrafts and credit cards) jointly account for 38.9 percent of the overall credit exposure to households. Housing loans still form a relatively small part of the credit portfolio of households: 20.5 percent as of December 31, 2010.

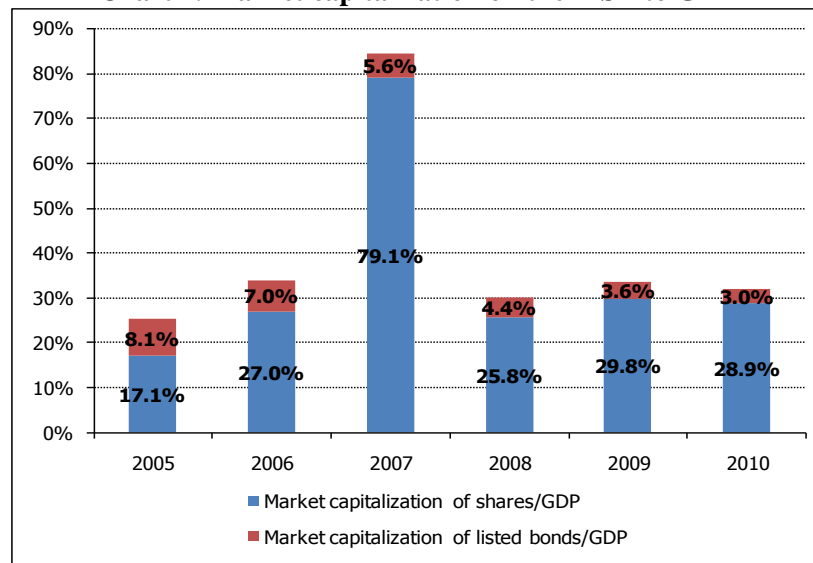
### The role of the capital market

The gradual increase of trading and price levels on the Macedonian Stock Exchange (MSE) began at the end of 2005 (Chart 7). The largest activity on the secondary capital market occurred in 2007, when the turnover on the stock exchange realized by classic trading was almost equal to the overall turnover realized in all other years in the period from 2005 to 2010 (except 2007). The growth of capital market turnover in the period 2005-2007 was mostly an outcome of the increased interest for trading of shares on the stock exchange, above all on the part of foreign institutional investors (mostly on the purchase side of the stock exchange turnover), but also on the part of the local public (particularly natural persons). This increase in trading was accompanied by a gradual growth of price levels on the MSE. One could even talk about a possible presence of a “price bubble” during 2007, when the MSE Index (MBI-10) reached a level 10 times higher than its basic value.<sup>8</sup> The growth of prices resulted in an increase of total market capitalization of listed shares and bonds, which reached its maximum in 2007 and represented 84.7 percent of GDP. However, since the last quarter of 2007, with the first signs of the world economic crisis and the increased inflationary pressures worldwide, there was a trend of constant decrease of the stock exchange turnover, increased trading restraint of potential investors, and outflow of foreign investors’ funds. Price levels on the MSE registered a significant downward correction during 2008 and mild but rather variable and unpredictable growth in the course of 2009 and 2010. Market capitalization of shares and bonds showed a significant drop, and at the end of 2010 was reduced to a level of 31.9 percent of GDP (as opposed to the ratio of banking system assets to GDP of 71.2 percent). If bonds are excluded, market capitalization is just 28.9 percent of GDP.

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<sup>8</sup> The MBI-10 index was introduced as of January 4, 2005, when the basic value was set to 1.000 index points.

**Chart 7. Market capitalization on the MSE to GDP**



Source: NBRM

### Macroeconomic environment and monetary policy measures

From 2004 until 2008, monetary policy went through several stages, accommodating changes in the macroeconomic environment and preserving price stability through the maintenance of exchange rate stability.

From the beginning of 2004 to September 2005, the monetary policy was conducted in conditions of growing deficit on the current account. In 2004 there was a more intensive growth of the domestic demand and export. Considering the high import component, the increased domestic export created higher import pressures. These developments contributed to significant widening of the current account deficit, from 4.1 percent of GDP in 2003 to 8.4 percent of the GDP in 2004. At the same time, the acceleration of the credit activities and the sharp deepening of the financial intermediation provided for additional financial support to the economy.

Unfavorable trends on the foreign exchange market, estimates on further aggravation of the current account position, and uncertainty about capital inflow dynamics required tightening of the monetary policy. This was also suggested by the relative indicators on foreign reserves, which were not favorable. In 2004, the reserves covered less than three months of the next year's imports of goods and services, indicating a need to increase the foreign reserves level. In such an environment, despite low inflation, a monetary policy response was necessary. It was aimed at relaxing the pressure on the current account and increasing the capacity to sustain the exchange rate stability. The Central Bank bills (CB bills) interest rate, as the main interest rate, generally had an upward trend and its cumulative growth was around 4 percentage points in this period. In February 2004 there was a shift in the type of the CB bills auctions, from "interest rates tender" to "volume tender," with the latter having better signaling features. At the same time, in order to prevent additional pressure on the foreign exchange market, the portfolio of the NBRM instruments throughout which the excess of liquidity can be absorbed was expanded by the introduction of CB bills with 7-day maturity, besides the CB bills with 28-day maturity. In addition to the increase of the main interest rate, the bank's reserve requirements were increased, from 7.5 percent to 10 percent from the beginning of 2005, both for denar and foreign currency

deposits. This measure was undertaken in order to reduce part of the structural excess of liquidity.

From the end of 2005 until the end of 2007, the flows in the balance of payments enabled accumulation of foreign reserves, creating space for continual monetary policy easing. Despite the high trade deficit, the significant growth of private transfer inflows enabled a narrowing of the current account deficit (excluding 2007). The continuity of a stable environment was a crucial factor that contributed to a significant increase of the foreign inflows through private transfers in this period. The private transfer inflows were gradually canalized as savings within the banking system. Another important characteristic for this period is the intensification of private capital inflows, especially more intensive foreign direct investments in the private sector. This process started in 2007, which was relatively late compared to the other transitional economies. In addition, the portfolio investments of the foreign investors on the MSE were also significantly intensified in these three years. It should be emphasized that by the end of 2007, there was a certain degree of liberalization of the portfolio investments.<sup>9</sup> In 2005, high inflows in the capital account were registered based on government borrowing on international capital market. In accordance with these flows, there was continuous purchase of foreign currencies by the NBRM on the foreign exchange market.

At the end of 2005, as foreign currency inflows and liquidity were growing, the appropriate monetary policy changes were undertaken. In October 2005, the CB bill auctions were reversed to “interest rates tender” auctions. In such an environment of excess of liquidity, the interest for investments in CB bills was high, which allowed continuous reduction of the main interest rate. Thereby, the interest rate had a downward trend, recording a cumulative fall of around 5 percentage points in this three-year period. Banking credit activities in this period were accelerating, resulting into fast financial deepening. Although these trends were translated into higher imports, these imports were largely alleviated by the export performances. Besides the intensive growth of the economy over potential, and new capital inflows, inflation remained low and inflation expectations were stable.

From the end of 2007 until the end of 2009, the monetary policy was tightened. At the end of 2007, strong inflationary pressures started to emerge, caused by the price shock on the world food and energy market. The combination of relatively strong domestic demand and aggravated terms of trade contributed to expansion of the trade deficit. The inflationary pressures worsened the expectations, which created pressure on the foreign currency demand and caused reduction of the private transfers. This contributed to expansion of the current account deficit, which in conditions of insufficient capital inflows increased the external vulnerability of the economy.

In February 2008 the NBRM changed the layout of CB bills auctions from “interest rates tender” toward “volume tender.” Simultaneously, the NBRM decided to increase the CB bill interest rate from 5.08 percent, which was the rate at the last auction before the change of tenders, to 5.25 percent. Additional interest rate increases were made in March and May 2008 and the interest rate reached 7 percent. With rising inflation and estimations for significant

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<sup>9</sup> The so-called foreign exchange rights for the banks dealing with portfolio investors were abolished. Before, the banks had to buy these rights from the NBRM; they were a kind of “bookings” for the future foreign exchange outflows from the foreign reserves, in cases when it was expected that the investments would outflow in a period shorter than one year. The price of these rights was linked to the main interest rate and the interest rates in the euro zone. The aim of this measure was to discourage the short term foreign capital fluctuations on the domestic market.

expansion of the current account deficit, one of the biggest challenges for the NBRM in that period was the strong credit activity growth, particularly of the credits to households.<sup>10</sup>

In the last quarter of 2008, the spillover effects of the global economic and financial crisis started to influence the domestic economy strongly, mainly through exports and the expectations channel. The emergence and escalation of the global crisis reduced inflation but increased uncertainty and risk and influenced the balance of payments through a decrease of exports and a slowdown of capital flows. The latter created great pressure on the foreign exchange market. In order to maintain the stability of the exchange rate and prices, the NBRM intervened by a net sale of foreign currencies.

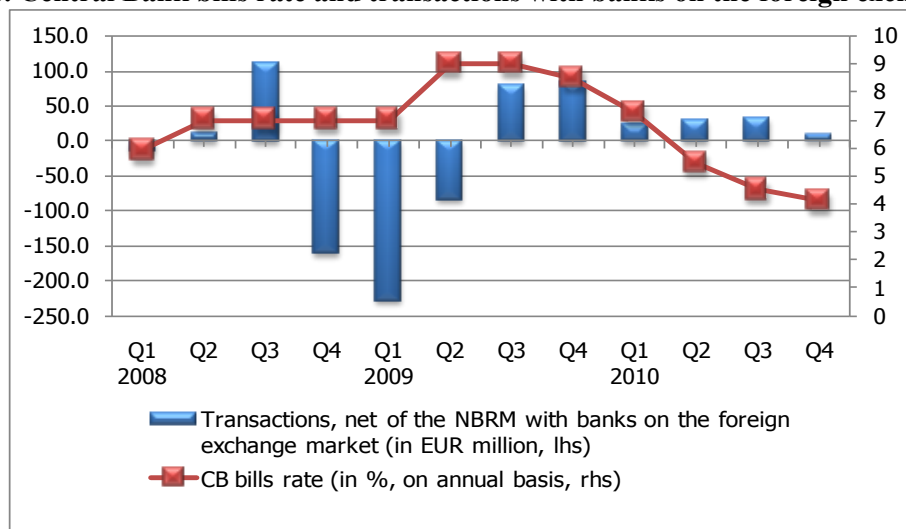
At the beginning of 2009, the external position of the economy deteriorated further, as exports significantly decreased while imports did not adjust, as domestic demand was still quite robust. The expectations continued to aggravate markets, which resulted in increased preferences for foreign currency instruments. In addition, although there was no “sudden stop” syndrome, the amount of capital inflows considerably decreased compared to the previous year. This combination of unfavorable factors caused strong pressures on the domestic currency, which was a reason for the NBRM continuing to intervene in the first five months of the year through net sales of foreign currencies. The decline of foreign reserves and the estimates for unfavorable future trends in the external sector, conditioned by the global recovery, imposed a clear need for monetary contraction. The NBRM increased the main interest rate from 7 percent to 9 percent in March 2009. As a response to the rising euroization of the deposit base, in May 2009 the NBRM had increased banks’ reserve requirements rate for deposits with a foreign currency (FX) component. This requirement came into force in July 2009 and increased of the rate on banks’ FX liabilities from 10 percent to 11.5 percent and the rate on liabilities in domestic currency with FX clause from 10 percent to 20 percent. In August 2009 the rate of banks’ FX liabilities rose from 11.5 percent to 13 percent.

As a result of the monetary measures undertaken, as well as of more positive and less uncertain forecasts about the world economy, a significant stabilization of expectations was registered in the second half of 2009 and throughout 2010. This enabled strong growth of private transfers. On the other hand, the domestic demand remained weak. During the slow recovery of funding sources and remaining perceptions of risks, the credit support by the banks was considerably reduced—credit growth fell to 3.5 percent in 2009 from 34 percent in 2008. Therefore, the import market started to adjust faster, allowing annual trade deficit reduction as of the second quarter of 2009. In the second half of 2009 there was a gradual improvement of the global environment, which contributed to a modest recovery of the export market sparked by growth of demand and export prices. In such conditions, there was a decrease of the current account deficit from 12.8 percent of GDP in 2008 to 6.7 percent of GDP in 2009. At the same time, high inflows into foreign reserves were registered through external borrowing by the government. These changes increased the foreign currency supply, allowing the purchase of foreign currencies by the NBRM and the replenishment of foreign reserves in the second half of 2009. The positive trends in the second half of the year exceeded expectations, which along with the estimates on a stable external position in the upcoming period provided an opportunity to relax the monetary policy (Chart 8). At the end of November 2009, the main interest rate of the NBRM was decreased by 0.5 percentage points.

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<sup>10</sup> See section on Prevention of high credit-growth risk.

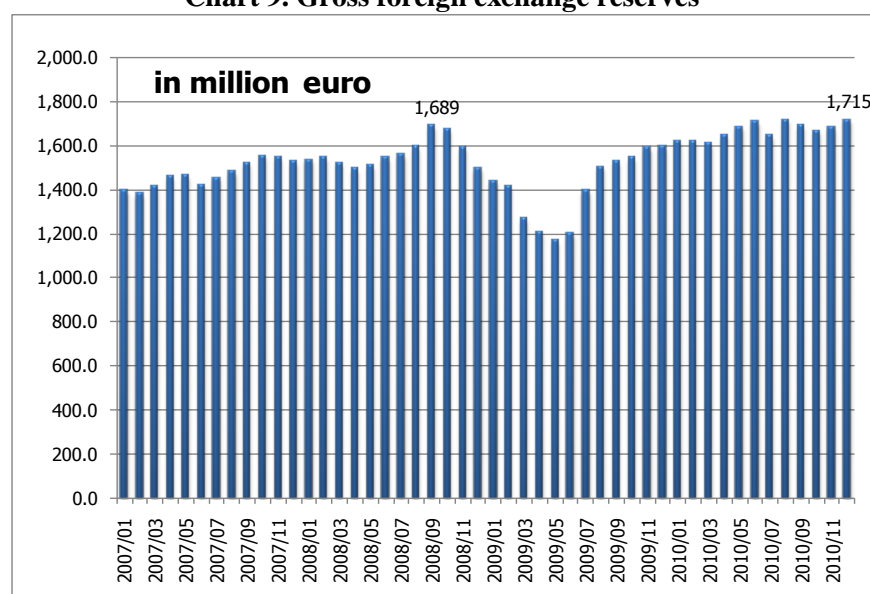
**Chart 8. Central Bank bills rate and transactions with banks on the foreign exchange market**



Source: NBRM

The process of monetary policy relaxation continued in 2010. The NBRM's main interest rate in this period was reduced seven times, thus bringing it to a historically low level of 4 percent in December 2010. The accommodative monetary policy stance in this period arose from the improvements in the macroeconomic environment. In 2010, there was a gradual recovery of economic activity. The current account deficit in 2010 was 2.8 percent of GDP, which represented a significant downward change for two years in a row. Although the capital inflows during 2010 were relatively lower than the year before, considering the low current deficit they were sufficient to enable further increases in the foreign exchange reserves. At the end of 2010 at a level of 1.715 million euros, the foreign reserves exceeded the pre-crisis level (Chart 9), and at the same time covering around four months of goods and services for the next year.

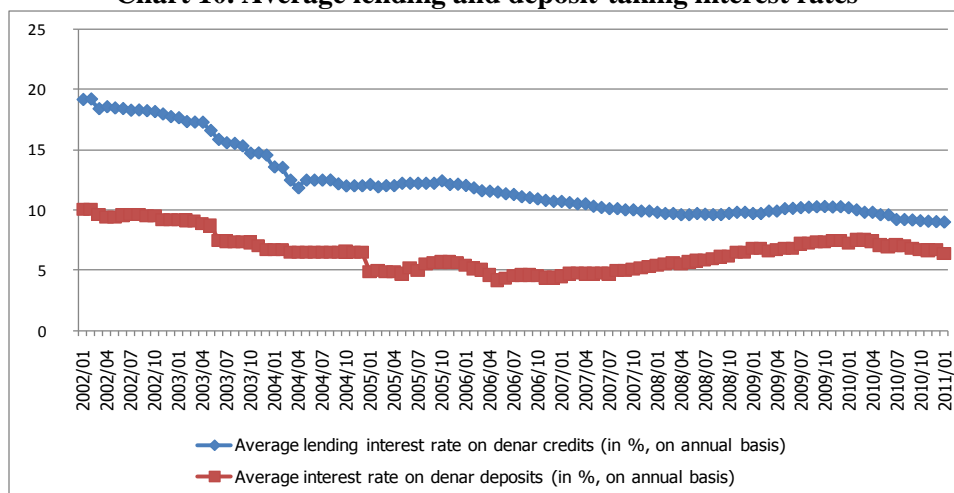
**Chart 9. Gross foreign exchange reserves**



Source: NBRM

Considering the fact that monetary policy measures in the analyzed period were mainly conducted through changes of the main interest rate, it is important to explain some features of the interest rate transmission channel. The transmission mechanism of monetary policy through the interest rate channel has been traditionally very weak,<sup>11</sup> although some improvements in the more recent years of the transition period are notable. When analyzing the interest rate transmission channel, one should keep in mind that the banking system is in a position of excess liquidity: banks do not borrow from the central bank but invest in its short-term securities. In the past couple of years, banking competition has proven to be a very important factor in the banks' interest rates, and it resulted in a declining trend of the lending interest rates—and in some years an increase in the deposit interest rates. The banks' interest rate spread went down on average from around 6.0 percent in 2004, to around 4.0 percent in 2008, and to 2.4 percent in 2010 (Chart 10).

**Chart 10. Average lending and deposit-taking interest rates**



Source: NBRM

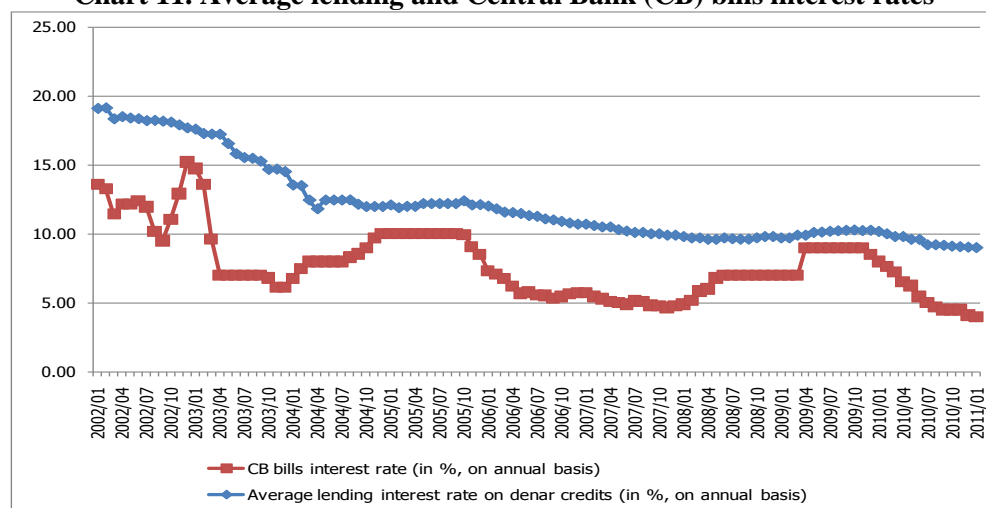
Historically, the pass-through effect seems to be stronger when there is a declining trend of the NBRM interest rate. The opposite direction of the main monetary policy rate, the increase in 2004, was not followed by the banks (see Chart 11). The downward trend of the banks' interest rates in 2004 was due mainly to the higher competitiveness in the banking system, the further enhancement of the banks' deposits, the improvement of the banks' credit portfolio quality, and higher efficiency in the banks' operation in that period. In 2008, monetary policy was tightening, the banks' lending interest rates remained almost unchanged, and the deposits interest rates were increasing in order to attract additional sources after low deposit growth at the initial stage of the world crisis. In 2009, the tightening of the monetary policy was only partially followed by the banks' interest rates. Like in 2008, the stronger reaction was again shown by the increase of deposit interest rates (by 1.2 percent) relative to the increase of the average lending interest rate (by 0.4 percent). In both years, the banks were reducing the interest rate spread,

<sup>11</sup> Different analyses within the NBRM for different analyzed periods have shown that only 2 to 10 percent of the main monetary policy interest rate change was transmitted over average lending interest rates on the banks' denar credits, in the same month or with a one month time lag. The accommodation of the short-run dynamics of the banks' lending interest rates to their long-term equilibrium usually is slow.



rather than worsening the credit conditions, striving to maintain relationships with good clients and preserve the propensity to save during the crisis period.

**Chart 11. Average lending and Central Bank (CB) bills interest rates**



Source: NBRM

## II. Macprudential Regulations

This section focuses on the macroprudential measures undertaken by the NBRM from 2004 to 2010. This seven-year time horizon encompasses the pre-crisis period (2004–2007), the crisis period (2008–2009), and the post-crisis period (2010). Within this period, the NBRM undertook four measures that have a macroprudential nature and were aimed (i) at reducing the systemic risk arising from the growth of the balance sheets and the risk-taking by banks and (ii) at enabling stable supply of banking services to the real economy:<sup>12</sup>

1. Regulation on foreign exchange lending
2. Amendments to the capital adequacy framework<sup>13</sup>
3. Prevention of high credit growth risk
4. Introduction of liquidity ratios

The four tools used by the NBRM are microprudential instruments in their essence, recalibrated to limit the systemic risk and to promote resilience of the banking system. The main purpose of the employed instruments was to address the amplification of the banking-system-wide risk by the interactions with the real economy. Even though it is difficult to draw a clear line connecting the four instruments, most of them are price-based tools, intended to protect the banking system against buildup of credit risk due to high credit growth.

In addition to the above-mentioned measures, in the precrisis and the crisis period the NBRM exploited a number of other tools that had certain macroprudential benefits. These tools, such as the monetary policy instruments (official interest rates, foreign market interventions, and reserve requirements), which were explained in more details in section I, other tools that are not

<sup>12</sup> The measures are listed chronologically, depending on the time of their introduction.

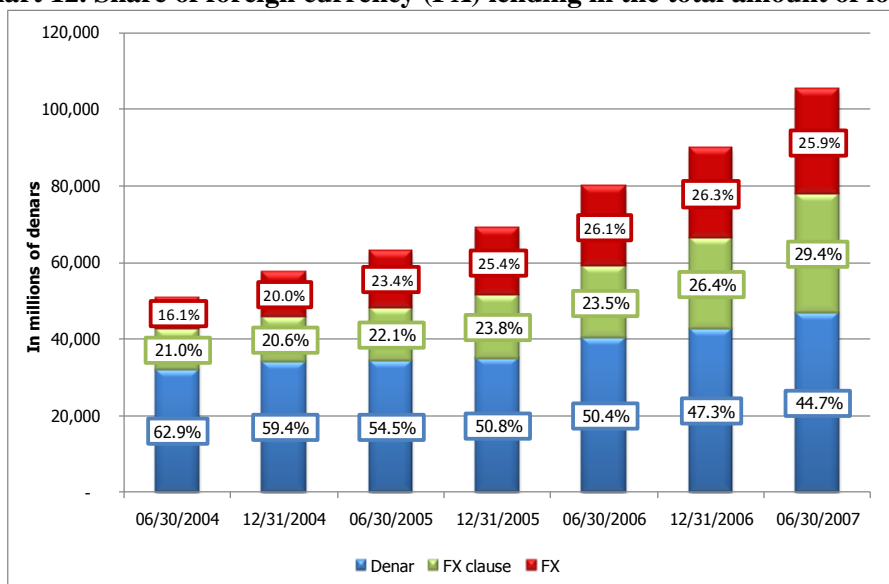
<sup>13</sup> These two measures have similar rationale and impact, which is why they will be presented jointly.

typically prudential in their nature,<sup>14</sup> or the discretionary warnings on the elevation of risk articulated in NBRM speeches or publications (e.g. Financial Stability Reports) are excluded from the focus of the following analysis.

### Regulation on FX lending

As with many other emerging markets and small economies, the presence of foreign currency in the everyday operation of individual business entities is considerably high. The banking system is not an exception to this pattern. The lending and deposit-taking in foreign currency are highly present in the banks' balance sheets. Looking at the data from 2004 to 2006, the share of FX lending<sup>15</sup> has grown by 15.7 percentage points (Chart 12).<sup>16</sup> At the end of 2006, for the first time the share of these loans was higher than the share of the denar loans.

**Chart 12. Share of foreign currency (FX) lending in the total amount of loans**



Source: NBRM

Despite the growth of the FX lending, the banking system was still among the systems with moderate participation in FX lending.<sup>17</sup> However, the recorded growth triggered the so-called induced credit risk, a credit risk arising from the clients' imbalances in the currency structure of their inflows and outflows. In order to address this growing risk, in 2006 the NBRM issued a decision on the conditions and the manner of extending FX loans and denar loans with FX clauses.<sup>18</sup> The decision regulates the conditions under which banks can extend FX loans and

<sup>14</sup> In January 2009, in light of unstable developments on the international financial markets and increasing risks, the NBRM launched auctions of FX deposits of the banks. The implementation of this measure started in February 2009 through auctions conducted by applying volume tenders, for unlimited amounts of FX deposits with maturity of 1, 3, 6, and 12 months. The interest rates of the FX deposits are equal to the interest rates of the funds placed on the international financial markets.

<sup>15</sup> The FX lending encompasses both FX loans and denar loans with FX clauses.

<sup>16</sup> The liberalization of FX legislation in 2003 supported the rise of the FX lending.

<sup>17</sup> As a comparison, the share of FX lending in some of the Baltic countries in 2005 was above 70 percent.

<sup>18</sup> The decision was not the first regulation of this kind. In 2003 the NBRM had adopted a similar FX regulation, which encompassed only the FX loans.

denar loans with FX clauses (the so-called FX indexed loans). The conditions are identical for both types of loans. Banks can extend these loans only if

1. the client is classified as “A” or “B”<sup>19</sup> client by the bank and by the banking system (as reported within the NBRM’s Credit Registry<sup>20</sup>), or
2. the claim is covered with first-rated collateral.<sup>21</sup>

In addition to these requirements, the decision requires banks to have written policies and procedures for the management of the induced credit risk. These internal acts should include, inter alia:

1. criteria for assessment of the (mis)match of clients’ FX assets and liabilities,
2. FX exposure limits, and
3. regular stress testing of the FX risk (at least on annual basis).

These requirements are not intended to limit FX lending but to enhance its quality, thus reducing the induced credit risk. As a result, the deterioration of the quality of the overall credit portfolio experienced in the previous years was less apparent within the FX credit portfolio. In the past two years (end of 2010 compared to end of 2008), the share of A” and “B” credit exposures to households and enterprises in the total credit exposure decreased by 2.9 percent,<sup>22</sup> while the share of FX credit exposures to households and enterprises classified in these risk categories decreased by 1.5 percent.

#### Prevention of high credit-growth risk and reduction of the credit risk arising from certain credit exposures

In a favorable macroeconomic climate (2004–2007), the banking system has experienced a substantial credit growth, reaching an annual growth rate of 39 percent at the end of 2007 (or an average annual growth rate for the three years of 27 percent). Even though these growth rates were mainly a result of the low starting base of the banks’ lending activities in the previous years, the intensive growth was close to crossing from a sustainable credit growth to a credit boom (Chart 4). The intensive credit growth was particularly notable in the banks’ lending to households.<sup>23</sup> The loans to this sector experienced considerably higher annual growth rates (58.8 percent at the end of the first quarter of 2008) compared to the growth of loans to enterprises, which had reached 33.5 percent at the end of the same period (Chart 6). The more dynamic growth was a compensation for the low level of lending activities typical for the period of transition, when banks generally restrained from granting loans to households. In 2004–2007, the

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<sup>19</sup> According to the decision on credit risk management, an “A” or “B” client is a client that pays its loan obligations as they fall due, or with insignificant delays, and that has solid credit history.

<sup>20</sup> The NBRM Credit Registry is a public-type credit registry that collects data from the domestic banks and saving houses on credit exposures higher than:

- For banks: denar 300,000 (almost euro 5,000) for legal entities and denar 5,000 (euro 82) for natural persons
- For saving houses: denar 50,000 (euro 820) for legal entities and denar 5,000 (euro 82) for natural persons.

<sup>21</sup> During the analyzed period, the first-rated collateral included cash and cash-equivalents; guaranties and securities issued by the country, the NBRM, central banks, and the governments of EU member-states, the United States, Switzerland, Japan, Canada, Australia and Norway; guaranties by first-rated banks; etc (in June 2011, there were certain amendments to this definition).

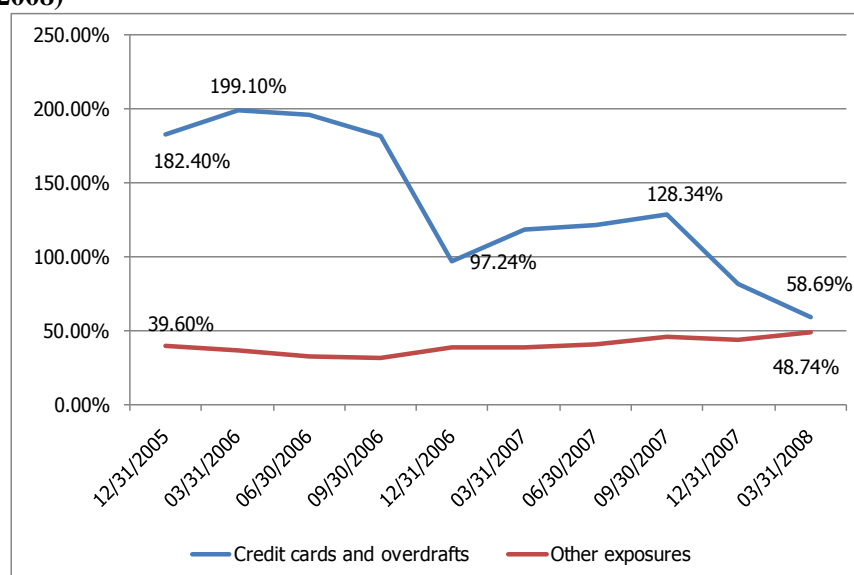
<sup>22</sup> Including the small traders but excluding the financial institutions and the government.

<sup>23</sup> The lending to households includes loans to small traders.

average growth rate of loans to households was almost 30 percentage points higher than the average growth of the loans to enterprises.

The composition of the credit growth to households according to the type of the credit exposure illustrates an asymmetrical growth of the different credit products. The annual growth of exposure from credit cards and overdrafts to households was especially high and in some periods it reached almost 200 percent (Chart 13). The growth of these credit products contributed by more than half to the total credit growth of loans to households. As a result, at the end of the first quarter of 2008, the exposures from credit cards and overdrafts reached their peak (39.5 percent of the total banks' credit portfolio to households).

**Chart 13. Annual credit growth of certain types of credit exposures to households (2005–March, 2008)**



Source: NBRM

In addition, this credit growth was followed by a deterioration of the overall credit quality of loans to households, which was particularly emphasized at the end of 2006 and throughout 2007. The analysis of the so-called old credit portfolio, that is, exclusion of the impact of the new loans granted to households during the period of September 2006 to September 2007, confirms the deterioration of the credit quality. For the duration of this period, the share of exposures to households classified in risk categories “C”, “D,” and “E” (categories with a higher credit risk) rose from 4.9 percent to 8.5 percent. In contrast, the deterioration of the credit quality of the loans to enterprises was less evident.<sup>24</sup> Once more, the exposures from credit cards and overdrafts recorded the highest decline of their credit quality. If analyzed through the same indicator, the share of “C”, “D,” and “E” exposures in the total amount of exposures from credit cards and overdrafts increased by more than 109 percent, annually. Their increase factored the annual growth of the total “C”, “D,” and “E” exposures to households by almost 40 percent.

There are several reasons for the decline of the credit quality of exposures from credit cards and overdrafts. First of all, they were relatively new products on the domestic financial

<sup>24</sup> The share of “C”, “D,” and “E” exposures rose from 12.2 percent to 12.9 percent.

market. Their features and advantages had provided banks with additional and relatively stable income source, which had increased the banks' competition. As a result, banks started to lessen the conditions for granting loans. In addition, more than 75 percent of the exposures arising from credit cards and overdrafts were unsecured claims. Hence, in an environment of advanced credit growth, coupled with lessening of the credit standards and inadequate collateral coverage, it was evident that the exposure from credit cards and overdrafts bore more risk than all other credit products to households. Moreover, the fact that it was a relatively new credit portfolio with a higher risk for further deterioration of the credit quality as a result of its aging, has additionally increased the NBRM's concerns on the possible negative impact that this credit portfolio might have on the whole banking system.

To address this potential problem, in the first half of 2008 the NBRM introduced two measures: higher risk weights for exposure from credit cards and overdrafts (amendments to the capital adequacy framework) and the introduction of acceptable growth rates for the total loans to households. These measures had similar goals: to discourage the excessive credit growth of the loans to households and to reduce the higher credit risk associated with some of these loans. In addition, these measures, along with other measures undertaken by the NBRM in that period, were aimed at lessening of the inflationary pressures coming from the demand side.

#### Amendments to the capital adequacy framework

With the first indications of the credit quality deterioration, in March 2008, the NBRM Council adopted amendments to the Decision on the methodology for determining the capital adequacy. These amendments introduced a new, higher risk weight (125 percent) for banks' claims from households arising from approved and used overdrafts and credit cards. The new risk weight was applied to both on-balance and off-balance sheet items (after the use of the credit conversation factor).<sup>25</sup> With the enlarged risk weight, the NBRM has sent a clear signal to the banks on the level of risk associated with the exposures from overdrafts and credit cards.

The rationale behind the introduction of this particular measure was three-fold: (i) it requires additional amount of own funds as a buffer for the growing risks; (ii) the higher capital requirement forces banks to enhance their capital position, which in return reduces the credit growth risk to an acceptable level; and (iii) it is a system-wide measure applied to all banks, which gives an additional prudential advantage to the measure.

As a result, in the following period banks had implemented more conservative lending approaches, which enabled substantial reduction of the credit growth of exposures from overdrafts and credit cards (Chart 14). In the quarter following the introduction of the measure, their strong credit growth was immediately decelerated and experienced a drop of 17 percentage points, which is the strongest slowdown in the entire period after the introduction of the measures.<sup>26</sup> As a comparison, in the period of 10 quarters before the introduction of the measure (September 2005 to March 2008), the exposures from overdrafts and credit cards increased by 279 percent and 1,127 percent, respectively. In the following 10 quarters after March 2008, their growth was considerably reduced (45.6 percent for overdrafts and 13.6 percent for credit cards).

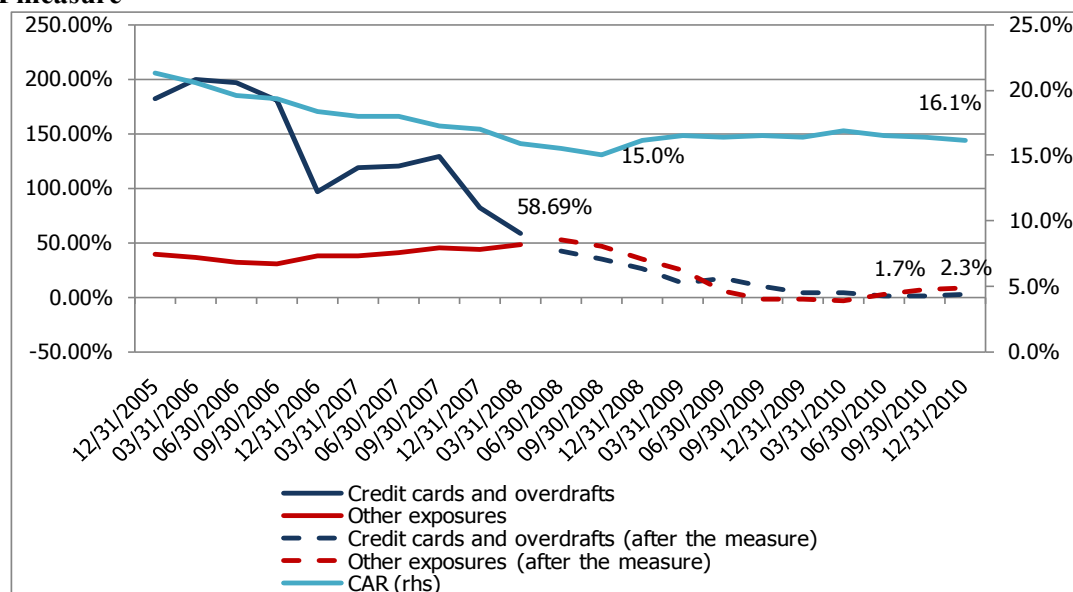
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<sup>25</sup> Following international standards, the off-balance sheet items are converted to on-balance sheet exposures by using credit conservation factors (CCFs). The CCFs for the potential exposures arising from unused overdrafts and credit cards are (1) 20 percent for potential exposures with maturity up to one year and (2) 50 percent for potential exposures with maturity above one year.

<sup>26</sup> In the same quarter, all other exposures to households had continued to grow.

At the same time, the capital adequacy ratio has experienced a slight, but important growth of 1.1 percentage point.

**Chart 14. Annual credit growth of exposures from credit cards and overdrafts, before and after the NBRM measure**



Source: NBRM

### Prevention of high credit-growth risk

The second measure that had reflected the credit growth of loans to households was introduced by the NBRM in June, 2008, with the adoption of the decision on the compulsory deposit with the NBRM. This decision defined the acceptable cumulative growth rates of loans to households with monthly dynamics for the rest of 2008, while in December 2008, the NBRM issued another Decision intended to cover the growth rates for 2009. With these two decisions, the annual growth rates of loans to households were projected at 39.8 percent, for the end of 2008 and 11.3 percent for the end of 2009.

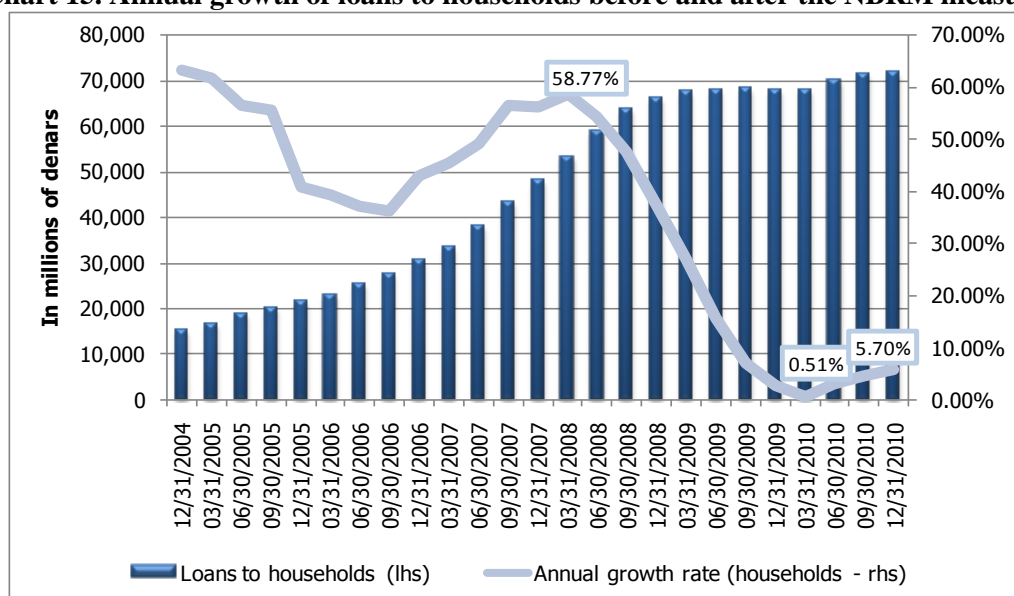
Whenever a bank's growth of loans to households was above the acceptable monthly rate, the bank was required to deposit with the NBRM an amount of funds equal to the achieved excess. The difference between the acceptable growth and the achieved growth constituted the compulsory deposit with the NBRM, on which NBRM paid an interest of 1 percent per annum.

This measure could not be regarded as a pure quantitative limitation of the credit growth. Banks were allowed to have higher credit growths than the rates prescribed with both decisions. However, the measure had made the higher credit growth more costly for the banks. The requirement for a compulsory deposit was an attempt to sterilize a certain amount of banks' funds, which could not be used for other purposes, including lending activities to households. The measure had one additional intention—to prevent the possibility of a credit growth transfer, from the exposures from credit cards and overdrafts to other similar types of exposures to households (for example, consumer loans). The possibility for this transfer became visible with the introduction of the previous measure—the requirement for higher risk weights on exposures from credit cards and overdrafts.

During the period of the effectiveness of this measure, only one bank was constantly within the prescribed monthly rates. On average, seven banks were above the acceptable growth rates, per month. The average excess during the period of one and a half years was 3.88 percentage points above the acceptable growth rates, with the highest excess in the whole period was 70.8 percentage points. However, it should be pointed out that these excesses were more frequent in the first several months after the introduction of the measure. Even though there were still banks that were above the monthly rates,<sup>27</sup> the achieved annual growth rate on loans to households for 2008 was 37.4 percent, which was 2.4 percentage points below the acceptable maximum. This trend continued in 2009, which was clear proof that the measure had served its purpose.

After the introduction of the measure there was a significant decline in the growth of the loans to households, from almost 60 percent at the beginning of 2008 to 5.7 percent at the end of 2010, or a decline of more than 90 percent (Chart 15).

**Chart 15. Annual growth of loans to households before and after the NBRM measure**



Source: NBRM

### Liquidity ratios

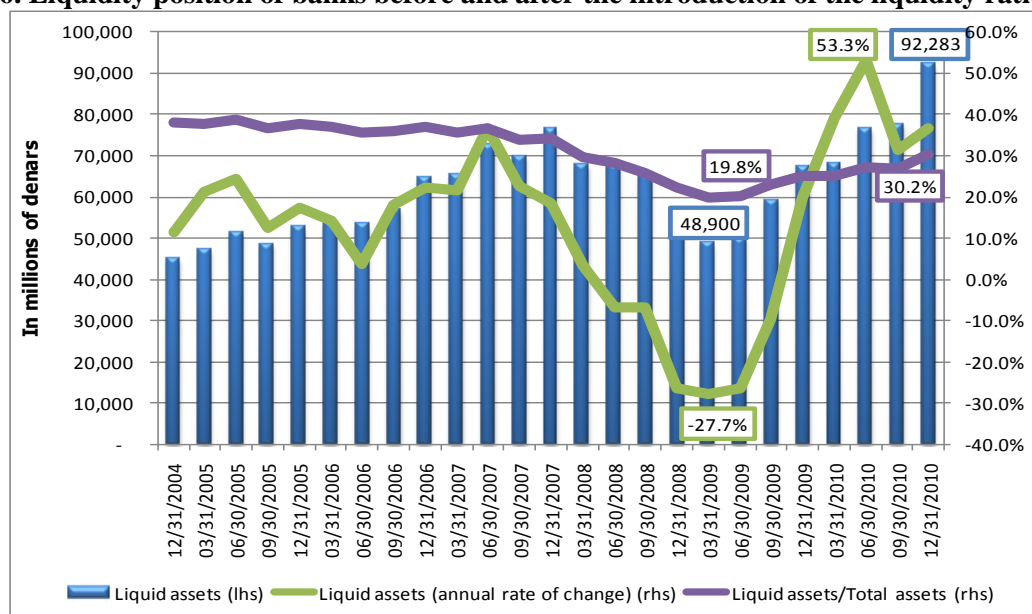
The fourth measure that was introduced by the NBRM was intended to enhance the liquidity position of banks. In general, banks had a prudential and conservative approach to liquidity risk management in the pre-crisis period, which enabled them to accumulate adequate levels of liquid assets to address the challenges that emerged during the crisis period. However, the global financial turbulence and the contraction of the international capital flows had certain impacts on the banks' liquidity, which resulted in a decline of the growth of the liquid assets in 2008 (Chart 16).

The expectations were that the impact of the international financial and economic crisis over the economy could accelerate in the following period. Therefore, there was a necessity to

<sup>27</sup> At the end of 2008, there were six banks that were above the prescribed monthly rates, which was one of the reasons why the NBRM decided to extend the use of this measure for 2009 (in addition to the fact that the risk from the high credit growth of loans to households was still relatively present).

improve banks' liquidity-risk-management systems and to strengthen their liquidity position, which was achieved through the adoption of the decision on liquidity risk management at the end of 2008.<sup>28</sup>

**Chart 16. Liquidity position of banks before and after the introduction of the liquidity ratios**



Source: NBRM

This decision quantifies the adequate level of liquidity of banks in the banking system. Banks are required to adhere to two liquidity ratios of assets and liabilities maturing in the following 30 and 180 days (LR30 and LR180). Both ratios are calculated and maintained separately for assets and liabilities in domestic and in foreign currency, and should be at least equal to one. Assets and liabilities are slotted into maturity buckets up to 30 days and up to 180 days, according to their residual maturity, that is, according to the remaining period to their contractual maturity.

The decision allows for a special treatment of the monetary policy instruments of the NBRM and the sight deposits and transaction accounts with banks:

1. The instruments of the NBRM (excluding the foreign currency reserve requirement) are included in the calculation of the liquidity ratios, regardless of their maturity and currency. Banks have an option to choose whether they will use the NBRM's instruments for achieving the required liquidity ratio in domestic currency or in foreign currency (but not for both ratios). This option was introduced in May 2009 and was effective until March 2011. In February 2011, the NBRM introduced a new instrument for the banks,<sup>29</sup> a six-

<sup>28</sup> A similar regulation was adopted in previous years, but it was mainly of a qualitative nature—it had defined the qualitative requirements for adequate liquidity risk management.

<sup>29</sup> A denar deposit with the NBRM, with a six months maturity and an interest rate equal to the six-month EURIBOR plus 0.5 percentage points. The early withdrawal of the deposit is allowed. The option given to the banks to use this instrument for achieving the denar or FX liquidity ratios should increase its attractiveness, thus stimulating banks to transform part of their CB bills investments into this instrument. In this way, the remaining portion of the CB bills will have the cleaner function of a fine tuning instrument.



month deposit with the NBRM. With its adoption, the previous broad option was limited only to this new instrument.

2. For the sight deposits and transaction accounts, the decision defines a minimum amount of these funds that should be covered with an appropriate level of liquid assets. Banks are required to have a coverage ratio of at least 30 percent of the sight deposits and transaction accounts. In addition, banks that have higher concentration levels within these sources of funds are required to secure higher coverage ratios. The concentration level is measured through the share of the 20 largest holders of transaction accounts and sight deposits in the total amount of transaction accounts and sight deposits. Whenever this level is higher than 30 percent, banks have to adhere to higher coverage ratios.<sup>30</sup>

With the two liquidity ratios, the NBRM has provided banks with an appropriate dynamic for achieving the prescribed minimum. The dynamic for LR30 ended in February 2011, while the dynamic for the liquidity ratio with the longer time-horizon will end in February 2014.

At the end of 2010, all banks had LR30 greater than one, both for positions in domestic currency and positions in foreign currency, while the weighted average of LR30 of the whole banking system was 1.5 (for both positions). For LR180, most of the banks are within the prescribed dynamic or have already achieved the minimum level of liquidity.<sup>31</sup> Only two banks have LR180 for positions in foreign currency lower than the prescribed dynamic, and these banks have presented the NBRM a plan for achieving the required liquidity level.

As a result, at the end of 2010 liquid assets are at their highest level in the six years (Chart 16). The share of the highly liquid assets increased by 226 percent (compared to the end of 2004), due mainly to the amplified investments in NBRM bills and government securities. Keeping in mind the weighted averages of the prescribed liquidity ratios that at the end of 2010 were slightly above the minimum, it could be verified that the buildup of the highly liquid assets was aimed mostly at achieving that minimum. The growth of the liquid assets has bestowed a considerable boost of the liquid-to-total assets ratio of more than 52 percent from its lowest level at the end of the first quarter of 2009, the first period when banks had to adhere to the prescribed dynamic for achieving the minimum liquidity ratios.

Besides the quantitative liquidity requirements established with the decision on liquidity risk management, this regulation has one additional built-in stabilizer. It defines the minimum liquidity risk management standards that should be applied by all banks in the country. These standards refer to the whole process of identification, measurement, monitoring, and control of the liquidity risk, which, *inter alia*, requires the appropriate participation of senior management and the internal audit function, implementation of efficient bank reporting system, development of a contingency plan, and regular (at least annual) liquidity stress testing.

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<sup>30</sup> Thirty-five percent for a concentration level of 30 percent to 50 percent, and 40 percent for a concentration level higher than 50 percent.

<sup>31</sup> At the end of 2010, the weighted average of LR180 for the banking system was 1.3 (for denar positions) and 0.7 (for FX positions).

### III. Future Challenges

#### Cross-border regulation and national regulation

Although foreign owners are highly present in the banking system, the NBRM encountered neither serious problems in the introduction and performance of the macroprudential regulations nor divergence with home country supervisors. On the contrary, the cooperation with some of the home supervisors had been elevated in the previous period, largely through the operation of the supervisory colleges established for the banking groups that do business in the country. The topics discussed by the supervisory colleges included financial stability concerns and measures undertaken by the home and host supervisors as a crisis response. Nonetheless, there is still a room for improvement of this cooperation. For some of the existing subsidiaries (especially subsidiaries that are considered as immaterial for the banking group), the NBRM has not succeeded in establishing efficient cooperation and exchange of data with the home supervisor, or the subsidiary was left out of the supervisory colleges. In addition, as a host supervisor, the NBRM is not always adequately included in the various banks' decision-making processes. The new European Union supervisory architecture should enable the removal of these deficiencies, even though this could be verified only after a period of full implementation of the new rules.

Due to the dominant participation of Greek shareholders in the ownership structure of the banking system, the NBRM closely monitored the development of the crisis in its neighbor country. In order to determine some of the potential spillover effects of the sovereign-debt crisis in Greece within the country's banking system, as well as to assess its own resilience to external shocks, in March 2010 the NBRM conducted a simulation of deterioration of the creditworthiness of several types of debtors of banks (applying two degrees of deterioration—moderate and extreme).

The simulation of credit shock included three types of debtors:

1. domestic net exporters to Greece,<sup>32</sup>
2. domestic firms that hold debt with Greece, and
3. Greek entities that hold debt with the country's banks.

The results of the simulation point to a relatively high resilience of the country's banks to some of the potential negative effects of the Greek crisis. Even in the case of the extreme simulation (all clients migrate to the worst-risk category), none of the banks experience a decrease of the capital adequacy ratio (CAR) below 8 percent.

#### Unregulated or lightly regulated institutions

The existence of a shadow banking system in the country is extremely limited. The country's financial system is reasonably supervised, and all relevant financial sectors operate under a certain type of regulation. In addition, it is a bank-centric system. The dominance of the banking sector is evident through all relevant variables: share of total financial assets, number of institutions, and percent of GDP. As a result, the bulk of the lending activities on the domestic market are performed by banks and saving houses.

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<sup>32</sup> These do not include entities whose exports to Greece make up less than 20 percent of their total exports nor entities whose debt to banks is more than 400 percent of their net-export to Greece.

The leasing companies are the only financial sector that has a somewhat higher share in the lending market. Their establishment and operation are regulated with the 2002 Law on Leasing, amended in 2006, 2008 and 2011. Under this Law, only companies that have acquired license from the Ministry of Finance can perform leasing activities. The procedure for acquiring the necessary licenses is to a large extent similar to the one that applies to banks in the country, both for licensing of shareholders and licensing of management bodies. The Ministry of Finance is responsible for the supervision of the leasing companies, issuance of corrective measures, and withdrawal of the operating license. The structure of the law and its bylaws represents a solid basis for adequate regulatory treatment of the leasing companies, and diminishes the possibility of a significant transfer of lending activities from banks to these financial institutions. The share of the leasing companies in the country's total financial assets verifies this conclusion. During the period when the NBRM introduced its macroprudential measures aimed at the banking system (2008 and 2009), the share of the leasing companies remained almost unchanged (around 3 percent).

In order to ensure adequate treatment of all financial institutions that might extend loans to clients, at the end of 2010 the Law on Financial Companies was adopted by the Parliament. The law covers all financial institutions that extend loans, issue credit cards, perform factoring activities, or issue guaranties. These institutions could perform these activities only after the receipt of a license issued by the Ministry of Finance. Again, the licensing procedures follow the criteria and the conditions applicable to banks. In addition, the law limits the total lending of these institutions to no more than 10 times of their capital and reserves.<sup>33</sup> This new legislation provides for an additional prevention of imprudent behavior by lending institutions that are not banks.

### Implementation of the new capital requirements (Basel III)

The discussion on the future challenges would be incomplete without a reflection on the implementation of the reform of the capital adequacy requirements (the so-called Basel III). Immediately after the release of the final document on the global framework for more resilient banks and banking system, the NBRM performed an analysis on its impact on banks. The current capital adequacy framework defines the own funds in a more prudent manner than the definition outlined in the Basel II framework. According to the decision on the methodology for determining the capital adequacy, Tier 1 capital includes equity capital and reserves and retained earnings (including the current profit, if it fulfills certain prudential filters). The regulation disallows banks to regard any debt instruments (such as the innovative instruments) as Tier 1 capital, regardless of their capital-like features. Consequently, the Tier 1 capital defined with the current capital adequacy framework is to large extent similar to the Basel III definition of common equity.<sup>34</sup> Hence, expectations are that banks will be able to fulfill the higher capital ratios.

The current level of solvency position of banks in the country confirms these expectations (Chart 17).<sup>35</sup> At the end of 2010, the capital adequacy ratio of the banking system equaled 16.1

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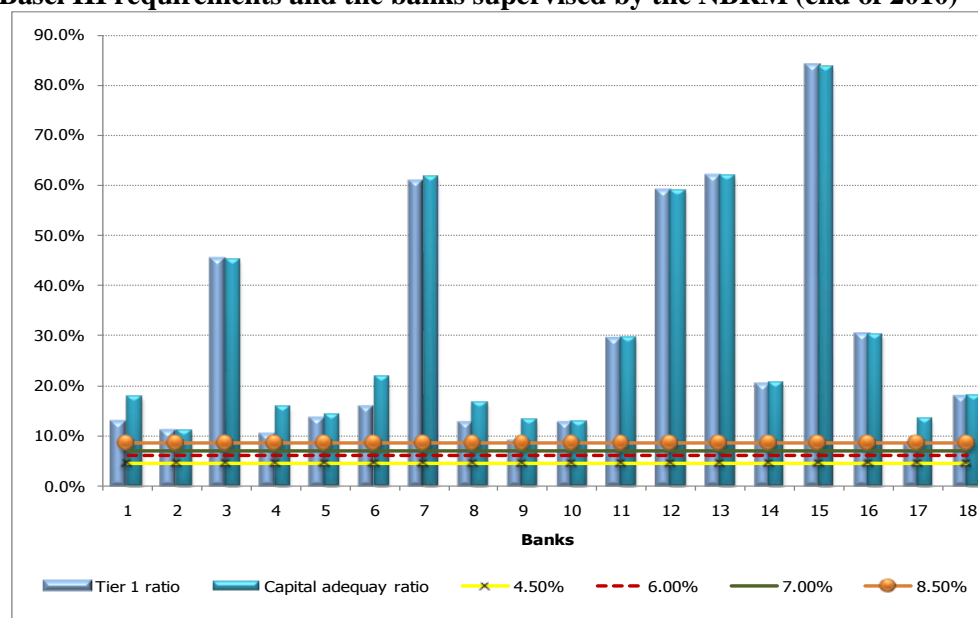
<sup>33</sup> According to the law, the capital of the financial companies cannot be lower than 100,000 euro.

<sup>34</sup> There are small differences in the manner of calculating the deductible items, but due to the low share of these items in the banks' capital level, the differences are immaterial.

<sup>35</sup> Due to the close similarities of the common equity and the Tier 1 capital under the banking system's capital framework, the amount of common equity is not presented separately in the chart.

percent. All banks are above the minimum common equity ratio (4.5 percent), Tier 1 ratio (6.0 percent), common equity plus conservation buffer ratio (7.0 percent), and total capital adequacy ratio (8.0 percent). Only one bank has a Tier 1 ratio slightly lower than the minimum of 8.5 percent for the Tier 1 plus conservation buffer, and only one other bank has a ratio that is close to that minimum (9 percent). In addition, all banks in the country have leverage ratios well above the Basel III minimum of 3 percent (6.1 percent to 43.6 percent), or a weighted average of 10.3 percent.

**Chart 17. Basel III requirements and the banks supervised by the NBRM (end of 2010)**



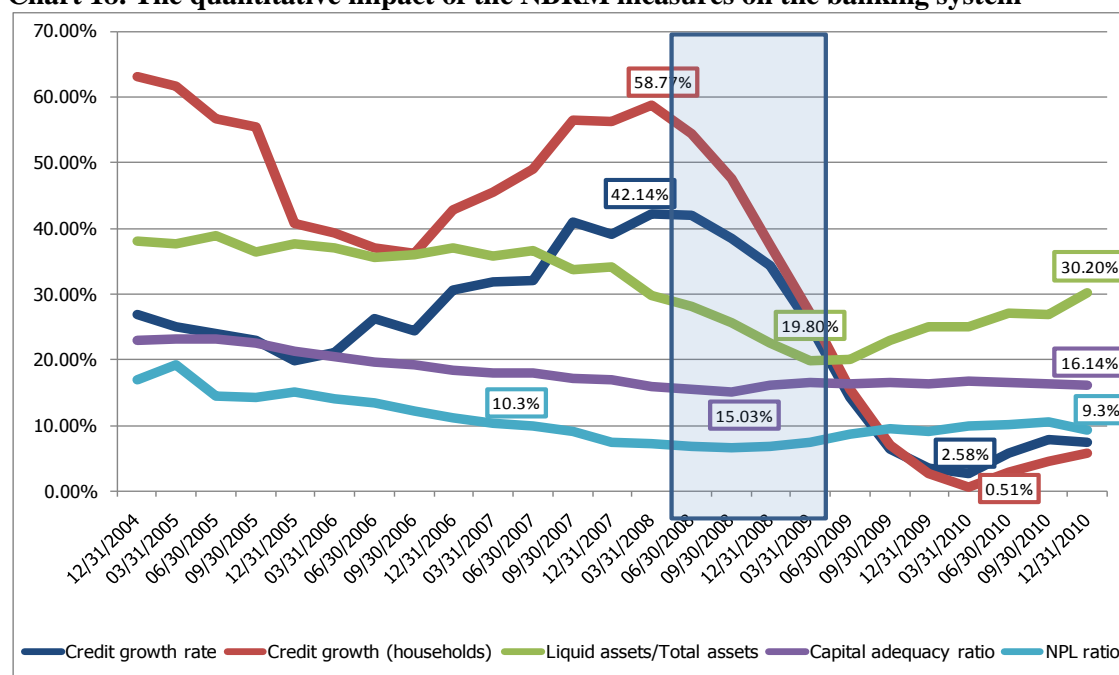
Source: NBRM

As was illustrated in the introduction, at the end of 2008 the NBRM has quantified the acceptable liquidity position of banks. The two liquidity ratios correspond to a certain degree to the liquidity standards defined with Basel III. There will be a necessity for further calibration of the existing LR30 and LR180 with the liquidity coverage ratio and the net stable funding ratio. However, the fact that banks are already required to maintain certain levels of liquidity will considerably lessen the regulatory burden for adequate implementation of the new Basel III liquidity standards.

#### IV. Conclusions

It is quite difficult to measure the effectiveness of the macroprudential toolkit employed by the NBRM and to isolate its independent impact, since it was undertaken in conjunction with other stabilization measures. In addition, the macroprudential measures are of recent nature, and there is still not enough theory and experience worldwide against which to assess contribution. Nevertheless, this section attempts to summarize their quantitative and qualitative impact. The quantitative approach measures the impact of the employed macroprudential instruments through an assessment of the tendencies of the variables targeted by these instruments. The qualitative approach is focused at identifying and understanding the key experiences and lessons learned by the NBRM in the previous period.

**Chart 18. The quantitative impact of the NBRM measures on the banking system**



Note: NPL= Nonperforming loans

Source: NBRM

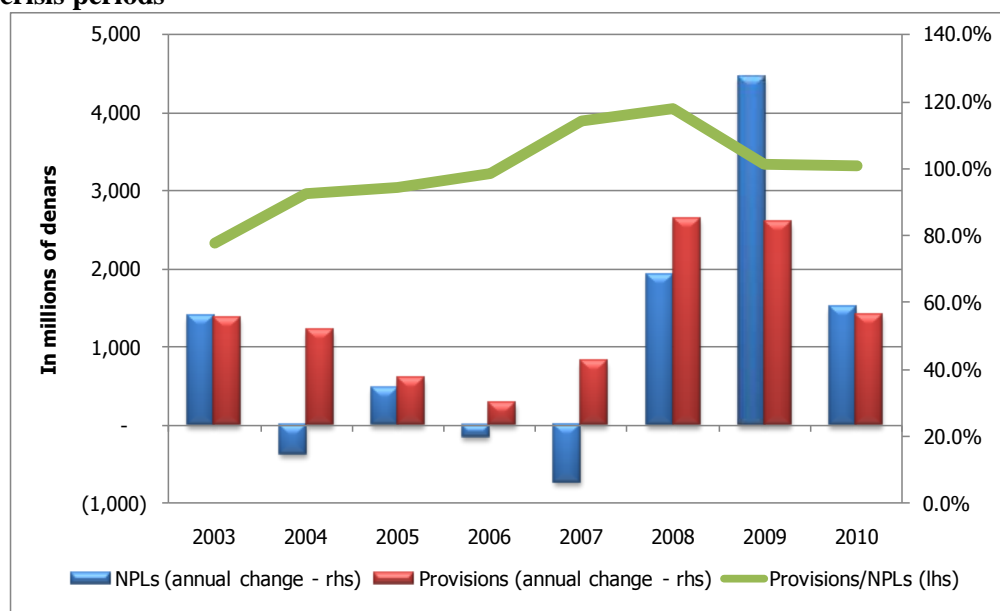
As we have seen, the main target of the NBRM measures were the credit growth (especially the growth of the loans to households), the quality of banks' credit portfolio, the banks' liquidity position, and the enhancement of the capital adequacy of the banking system. The results are rather evident (Chart 18). Most of the macroprudential measures (three out of four) were undertaken in a period of one year, from the first quarter of 2008 till the same period in 2009. In this period, all of the analyzed indicators experienced positive movements; they are particularly apparent for the credit growth, both of the overall portfolio and of the loans to households. During this one-year period, the annual growth rate of the overall portfolio decreased by almost 40 percent, while the loans to households were reduced by 54 percent. At the same time, the liquid-to-total-assets ratio was been elevated by more than half from its lowest level at the end of the first quarter of 2009.<sup>36</sup> In addition to the undertaken measures, it should be emphasized that the credit growth slowdown was also a result of the negative impact of the financial crisis over the domestic economy. The worsening of the real sector performances, the decline of the disposable income of households, and the higher uncertainty had influenced the lending practices of banks. The banks strengthened their credit-granting criteria, which has additionally decreased the amount of loans to the real sector.

From the analyzed variables, the only indicator that has a diverse path is the share of the nonperforming loans (NPL ratio). This ratio experienced its lowest level right in the middle of the crisis period (third quarter of 2008) and its peak in the post-crisis period (10.6 percent at September 2010). The main reason for this behavior of the amount of NPLs is associated with the maturity of the banks' credit portfolio. Namely, due to the credit growth, the newly extended

<sup>36</sup> This is a starting date of the dynamic for achieving the prescribed liquidity ratios.

loans made a greater contribution to the total credit portfolio.<sup>37</sup> With the aging of the portfolio, the amount of NPLs has grown, which has had an adverse impact on its share in the total portfolio. However, when analyzing the level of NPLs, one should bear in mind the level of allocated provisions. During the five years from 2003 to 2007, the annual change of the amount of provisions has always been positive, while the amount of NPLs has experienced a slowdown (Chart 19). As a result, in this period banks have built up an excess of provisions over NPLs by more than 3.7 billion denar. This excess provided banks with an adequate buffer, which was used during the following three years (2008–2010). At the end of 2010, the provisions-to-NPLs ratio is still adequate and enables full coverage of the NPLs with the allocated provisions (100.7 percent).

**Chart 19. Annual change of nonperforming loans (NPLs) and provisions in the pre-crisis, crisis, and post-crisis periods**



Source: NBRM

What were the lessons learned during the implementation of the macroprudential measures? First of all, maybe the most valuable experience was related to the role of the NBRM. This central bank established monetary policy and carries out supervisory responsibilities. In addition, beginning from 2006, the NBRM has intensified its duties related to the monitoring of financial stability.<sup>38</sup> As a result of the fact that all these tasks are under one roof, the NBRM has at its disposal adequate monetary and supervisory data to detect the main vulnerabilities of the banking and the financial system and to act accordingly. The crisis has proven that the efficiency of the undertaken measures is largely dependent on the right data and the timely reaction.

Regardless of these sound preconditions, it was rather challenging to choose the most appropriate measures. First of all, the NBRM, as all other central banks in this period, had little

<sup>37</sup> As a reminder, the analysis in the second section of this paper regarding the credit quality of the loan to households was performed with the exclusion of new credit exposures.

<sup>38</sup> The NBRM has issued its first Financial Stability Report, which reflects the trends and movements in 2006. With the adoption of the new Law on the NBRM (December 2010), financial stability is identified as one of the main tasks of the NBRM.

experience with the features and the use of macroprudential instruments. The timing and the adequacy of each instrument have proven to be most valuable for its effectiveness. In addition to the chosen measures, the NBRM had discussed several other measures, such as raising minimum capital adequacy ratio and limiting lending to certain industries, which could have amplified the system's resilience. However, the national bank had decided not to use these measures for the following reasons:

1. Banks in the country already had high capital-adequacy ratios, which had removed the systemic feature of this measure;<sup>39</sup> and
2. The NBRM was concerned that the quantitative limitation of lending to certain industries and sectors might have an adverse impact on the real economy.

Even though the macroprudential policy is not intended to be fair to all market participants and usually requires prompt reaction without enough time to analyze all possible impacts, some of the undertaken measures have demonstrated an uneven playing field for the banks in the country. The practice has shown that certain banks were “punished” more than others. Furthermore, in some of these instances, the “punished” banks were less risky than others in terms of their influence on the overall banking system. As a result, some of the banks had asked for a replacement of the macroprudential measures with a more micro-based approach. Thus, probably the most important lessons that should be drawn for the future are:

1. To develop a range of possible macroprudential tools for different crisis situations. Although it is difficult to predict all probable system-related emergencies, it would be reasonably easier if the responsible authority already have some instruments in place that could be adequately altered to correspond to the current situation.
2. The introduction and implementation of the macroprudential measures requires a more persuasive and robust communication with the industry, to demonstrate the rationale behind the undertaken actions, as well as to explain their effectiveness.

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<sup>39</sup> At the end of the first quarter of 2008, only two banks in the country had capital-adequacy ratios below 12 percent. Thus the rise of the minimum capital adequacy ratio by 2 to 4 percentage points would have had limited impact on the whole system.